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Agricultural Memorandum No 857.

FROSTS IN SEPTEMBER IN NORTH EAST CHESHIRE

At a meeting near Holmes Chapel early in October 1979 a grower from near Knutsford said that flowers intended for cutting had suffered severe petal damage from frost on 22 September. He then asked about frost frequencies in the area during September. As I hadn't figures with me at the time I couldn't give an instant reply but my impression was that the frequencies were very low.

Examination of the records published in the MWR shows that since Knutsford opened in 1962 there had never been an air frost in September, and the lowest minimum had been 0.5°C, in 1974. When the returns for 1979 were received the minimum on 22nd was 0.1°C - sufficiently close to freezing for there to have been a frost nearby.

The search was widened to include Winnington and Ringway Airport. Observations were published for Winnington between 1947 and 1975 and there were no records of air frost there in September; the lowest minimum was 0.6°C in 1964. Published records for Ringway extend back to 1942 but there was a change of site at the end of 1952. Only in 1942 and 1948 when the reported lowest minima were 32°F, 0°C, and in 1943, 1944 and 1947 when the reported lowest minima were 33°F (0.6°C) and in 1964 0.8°C has there been any close approach to freezing point in the screen. During the early 1940's a station at Warburton (53° 24'N 02° 26'W) reported minima of 31°F (- 0.5°C) in 1942 and 1943, and 32°F in 1944. Comparisons of the mean minima for these years with other years does not suggest that there is any relation between the minima during outbreaks of cold air and the mean minimum for the month. For example during yhe very cold September of 1952 the mean minima were 44.6°F, 7.0°C at Ringway and 47.2°F, 8.4°C at Winnington while the absolute minima were 35°F, 1.7°C and 38°F, 3.3°C, respectively.

The search suggests that the occurrence in the screen of minima approaching freezing point has been a rare event in September since the early 1940s, and the attached table illustrates the point. However, the temperatures which plants in a nursery experience are not those measured in a screen, and the only other measurement made with any regularity is the grass minimum temperature. The inadequacies of this element are well known and acknowledged but in the absence of any other data it has to be used.

A count of ground frosts at Knutsford shows that from 1962 to 1978 there had been 9, of which 3 occurred in 1972 and one each in 1964, 1965, 1969, 1974, 1975 and 1976 - and there were 4 in 1979. During the same period there had been one, in 1975, at Ringway and 4 (up to 1975) at Winnington, 2 in 1969, one each in 1974 and 1975 - and this year there were 4 at Ringway. These numbers suggest that while ground frosts were not unknown in September they could hardly be described as a common event. Using MWRs as a source of information before 1960 may not give a fair picture because the definition used for ground frost before that time was a temperature 30.6°F (- 0.8°C) or below which should tend to give a lower count than when using freezing point. Nevertheless there were 11 ground frosts at Ringway between 1942 and 1948 - 2 each in 1942, 1943, 1945, 1947 and 1948, and one in 1944, whilst at Warburton there were 4 each in 1942 and 1944, and 2 in 1941. During the

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1950s, Winnington reported ground frost only in 1952, a cold September, when there were 5, whilst at Ringway there were 4 that year (5 by the later criterion) and one each in 1957 and 1959. On this evidence it appears that the occurrence of ground frost in September in this part of Cheshire has been something of a rarity since the 1940s, whereas further south especially in Shropshire they have been fairly regular in occurrence.

It appears that the growers may have come to regard September as a month without risk of damaging frost at flower level and have been rather badly shaken by the events of this year. It was emphasised to the grower (in a letter) that the fact there had been a long interval since the last event does not mean there will necessarily be an equally long interval before the next event.

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November 1979

SEPTEMBER

RANK ORDER OF LOWEST MINIMA, 'MINMIN', AND MEAN DAILY MINIMA, 'MIN', WITH CORRESPONDING NUMBER OF GROUND FROSTS, 'GF', AT RINGWAY; TOGETHER WITH VALUES FOR OTHER STATIONS. [NUMBERS UNDERLINED REFER TO THE PRE1968 DEFINITION]

WINNINGTON		KNUTSFORD		RINGWAY				RINGWAY		KNUTSFORD	WINNINGTON
MINMIN	GF	MINMIN	GF	MINMIN	GF	YEAR	RANK	MIN	YEAR	MIN	MIN
				0	2	1942	1	7.0	1952		8.4
3.9	2			0	2	1948	2	8.1	1944		
				0.6	2	1943	3	8.2	1972	6.6	7.9
				0.6	1	1944	4	8.7	1974	7.8	8.5
				0.6	2	1947	5	8.8	1954		9.8
0.6	0	1.1	1	0.8	0	1964	6	8.9	1943		
1.3	1	0.5	1	1.3	0	1974	7	9.2	1950		10.2
		0.1	4	1.4	4	1979	8	9.2	1963	8.3	9.4
3.3	5			1.7	4(5)	1952	9	9.3	1957		9.9
4.4	0			2.2	0	1954	10	9.3	1975	8.1	9.4
3.9	0			2.2	1	1957	11	9.4	1942		
1.7	0			2.2	1	1959	12	9.4	1965	8.5	9.4
1.8	1	0.9	1	2.5	1	1975	13	9.6	1979	7.9	
				2.8	2	1945	14	9.7	1945		
3.9	0			3.3	0	1960	15	9.7	1962	9.3	10.1
1.7	2	2.2	1	3.6	0	1969	16	9.8	1948		11.2
5.7	0	4.3	0	3.7	0	1971	17	9.8	1960		9.7
5.6	0			3.9	0	1950	18	9.8	1964	9.0	10.3
3.9	0			3.9	0	1956	19	9.9	1976	8.5	
5.0	0	3.3	0	3.9	0	1962	20	10.1	1947		
		2.9	1	4.0	0	1976	21	10.1	1959		10.2
1.9	0	1.6	3	4.2	0	1972	22	10.1	1977	8.8	
3.9	0			4.5	0	1961	23	10.2	1965		11.4
5.0	0	4.4	0	4.6	0	1963	24	10.2	1966	9.6	10.7
4.1	0	3.5	0	4.6	0	1973	25	10.3	1953		10.9
4.4	0	3.9	1	4.9	0	1965	26	10.4	1946		
5.6	0	3.9	0	4.9	0	1966	27	10.4	1971	9.3	9.9
6.7	0			5.0	0	1958	28	10.5	1951		11.6
		4.0	0	5.2	0	1977	29	10.5	1967	9.7	10.5
3.9	0	4.1	0	5.5	0	1968	30	10.7	1978	9.6	
5.0	0			5.6	0	1951	31	10.9	1956		11.7
7.2	0			5.6	0	1955	32	10.9	1973	9.8	11.3
4.4	0	3.7	0	5.7	0	1967	33	11.1	1968	10.3	10.7
7.2	0			6.1	0	1953	34	11.1	1969	9.9	10.7
6.1	0	5.6	0	6.4	0	1970	35	11.3	1949		12.4
6.7	0			6.7	0	1949	36	11.3	1961		11.3
				7.2	0	1946	37	11.3	1970	10.5	11.6
		6.1	0	7.3	0	1978	38	11.8	1958		12.4